

been thus stopped, a bog was formed called "La Mare aux Songes," with an alluvial deposit varying in depth from three to twelve feet. The tortoise bones occur at a depth of three or four feet, imbedded in a black vegetable mould; lighter coloured specimens are from the vicinity of the springs. (Zool. Trans., vi. p. 51). Among these bones I have distinguished four species, the more important characteristics of which may be particularised as follows:—

1. *Testudo triserrata*.—Proximal half of the scapula trihedral, with the anterior side convex; acromium trihedral, straight. Coracoid ankylosed to scapula at an early stage of growth. Humerus moderately slender, with the shaft flattened, and a deep hollow between the head and tuberosities. Shaft of the ulna narrow, much twisted. Ossa ilei short and broad; transverse and vertical diameters of pelvis subequal; front part of pubic bones abruptly bent downwards. Femur stout, with much dilated condyles; a deep and broad cavity between the head and trochanters.

2. *Testudo inepta*.—Proximal half of the scapula trihedral, with the anterior side concave; acromium compressed, with the end curved. Coracoid never ankylosed to the scapula. Humerus moderately slender, with the upper half of the shaft trihedral, and without hollow behind the head. Shaft of the ulna broad, not much twisted. Ossa ilei narrow and long; vertical diameter of pelvis much exceeding in length the horizontal; front part of pubic bones gently declivous. Femur stout, with much dilated condyles, and with a deep and narrow cavity between the head and trochanters.

3. *Testudo leptocnemis*, sparsely represented, with a scapular similar to that of *T. triserrata*; ossa ilei of moderate length and width, femur slender, with moderately dilated condyles, and with a deep and broad cavity between the head and trochanters.

4. *Testudo boutonii*, known from scapular and humerus only. The former bone is strongly compressed; acromium with the end curved. Coracoid not ankylosed to scapula. Humerus very stout, with the shaft trihedral in its whole length, and without hollow behind the head.

C. The *Rodriguez Tortoise*.—The remains from Rodriguez which I have hitherto examined, and for which I am indebted to M. Bouton and to the trustees of the Glasgow Museum, consist of fragments of the cranium, perfect cervical vertebrae, pelvis, and the larger leg-bones. They indicate one of the best marked species of the entire group, with a double alveolar ridge, and with the neck and limbs of greater length and slenderness than in any other species. The neural arch of the sixth nuchal vertebra is perforated by a large ovate foramen on each side close to the anterior apophyses. These perforations were closed by membrane in the living animal, and evidently caused by the pressure of the apophyses of the preceding vertebra, the animals having had the habit of bringing the neck in a vertical position, so that these two vertebrae were standing nearly at a right angle. Some of the bones are exceedingly large, larger than any of those from the Mauritius, and must have belonged to individuals of the size of our large living male from Aldabra.

II.—ROUND-HEADED TYPE: *T. indica*.

To this type belong all the specimens with a nuchal plate which have been deposited in British collections within the last forty years, or which elsewhere have been described or figured; and more especially the Tortoises from Aldabra. Whether all these specimens have come from this small group is impossible to say, as we know very little or nothing of their history. Although I have succeeded in bringing together a considerable number of specimens, from which it would appear that also in this much smaller division several races could be distinguished, I think it best to defer, for the present, the detailed publication of the results of my examination

which ere long may be supplemented or modified by important accessions.

In conclusion we may ask whether the facts which I have endeavoured to place before the readers of NATURE are more readily explained with the aid of the doctrine of a common or manifold origin of animal forms.

The naturalists who, with Darwin, maintain a common origin for allied species, however distant in their habitats, will account for the occurrence of the tortoises in the Galapagos and Mascarenes in the same way as, for instance, for the distribution of the Tapirs, viz., by the hypothesis of changes of the surface of the globe. Taking into consideration other parts of the Faunæ, they would have to assume, in this case, a former continuity of land (probably varying in extent and interrupted at various periods) between the Mascarenes and Africa, between Africa and South America, and finally between South America and the Galapagos. Indeed, the terrestrial and freshwater faunæ of Tropical America and Africa offer so many points of intimate relationship, as to support very strongly such a theory. The Tortoises, then, would be assumed to have been spread over the whole of this large area, without being able to survive long the arrival of man or large carnivorous mammals. The former, especially before he had provided himself with missile weapons, would have eagerly sought for them, as they were the easiest of his captures yielding a most plentiful supply of food; consequently they were exterminated on the continents, only some remnants being saved by having retired into places which by submergence became separated from the mainland before their enemies followed them. With this hypothesis we would be obliged to contend for this animal type an age extending over enormous periods of time, of which the period required for the loss of power of flight in the Dodo or Solitaire is but a fraction.

To my mind the advocacy of an independent origin of the same animal type, however highly organised, in different localities, seems equally justified. It has been urged that closely similar structures of the animal organism have been developed without genetic relationship; so, also, the same complex organic compound, as sugar, is produced normally by the plant and abnormally by the human organism. Without overstepping too far the limits of probability, we may assume that some Land-Tortoises were carried by stream and current from the American Continent to the Galapagos, and that others from Madagascar or Africa, found in a similar manner a new home in the Mascarene Islands. These tortoises may originally have differed from each other, like the *Testudo tabulata*, *radiata*, *sulcata* of our days, possibly not exceeding these species in size, but being placed under the same external physical conditions evidently most favourable for their further development, they assumed in course of time the same gigantic proportions and other peculiarities, the modifications in their structure which we observe now being partly genetic, partly adaptive.

Thus this curious phenomenon in the geographical distribution of animals can be explained by either of those two theories, and does not appear to me to strengthen the position of one more than that of the other. The multiplicity of the races which I have pointed out above I need not further discuss. As regards the Galapagos, this fact is quite in accordance with what has been long recognised in the distribution of the birds of the same archipelago, and the co-existence of several races in Mauritius is perfectly analogous to the variety of species of Dinornis in New Zealand.

ALBERT GÜNTHER

NOTES

PROF. SCHÜNFELD, of Mannheim, has been appointed successor to the late Prof. Argelander as Director of the Observatory at Bonn, and will enter upon his duties on Sept. 1. Dr.

Valentiner, chief of the German Astronomical Expedition to Chefoo, and first assistant at the Leiden Observatory, will succeed Schönfeld at Mannheim.

THE biennial general meeting of the essentially International Astronomical Society will be held at Leiden from the 13th to the 16th inst.

THE Professorship of Natural History at the Newcastle College of Physical Science, vacated by the removal of Dr. Alleyne Nicholson to St. Andrews, has been filled by the appointment of Mr. George S. Brady, of Sunderland. The chair has hitherto been held in conjunction with the Lectureship on Physiology in the Durham University College of Medicine, in Newcastle, a union which it has been found expedient to abolish. The appointment we now record will be regarded with satisfaction by every one who is desirous of seeing the value of the labours of our working naturalists duly recognised in the localities where they have carried on their work.

THE Natural History Society of Newcastle, one of the best in the kingdom, appears to be going through a crisis. At a recent meeting, several of the honorary curators sent in their resignations, including names so well known as H. B. Brady, G. S. Brady, H. B. Bowman, Lebour, and Freire-Marreco, together with both the secretaries. We understand that an informal meeting has been held by a number of those interested in the systematic teaching of natural history, to take steps for obtaining specimens to form an independent typical collection for the use of the professors of the College in their lectures. This is as it should be. Collecting for mere collecting's sake is no part of science; as an adjunct to systematic teaching it is invaluable. A great centre like Newcastle should possess such a collection formed for such a purpose; and the effort is worthy of support and assistance from all friends of science teaching.

AT the distribution of prizes to the Taunton College School by the High Sheriff of Somerset on July 29th, the headmaster, Mr. Tuckwell, commented severely on the exclusion of science from the competition of the Huish Scholarship, to which we drew attention in these columns some weeks ago. The High Sheriff said that he was one of the Trustees who had prepared the scheme; that, looking to the Founder's expressed desire to forward the study of theology, they had wished so to shape the examination as to carry out his views; but that the Trustees were not a bigoted body, nor unduly wedded to their first opinion; that Mr. Tuckwell's criticisms deserved attention; and that he promised on behalf of the Trustees to reconsider the arrangements before another year. In thanking the High Sheriff for the liberal tone in which he had met the questions raised, Mr. Tuckwell protested against the belief that a divine worthy of the name could be trained in the present day by any system of education which should exclude a deep knowledge of science.

M. MOUCHEZ, the new member of the Academy of Sciences, has just organised a Practical School of Astronomy at Montsouris. Refractors, equatorial as well as meridian, and horizontal telescopes will be placed at the disposition of any competent person wishing to be instructed in astronomy. An astronomer from the National Observatory will instruct the pupils without fee; the Minister of Marine has ordered that two marine officers should always be in attendance for this purpose. The course of instruction will embrace celestial photography and spectrum analysis. No qualification of nationality will be required for admittance, only general competency.

M. WURTZ, Professor in the Faculty of Medicine of Paris, has been appointed Professor in the Faculty of Sciences.

THE French Association for the Advancement of Science commences its sittings at Nantes this day week.

M. LE VERRIER has presented to the Prefect of the Seine a plan for connecting, by means of a telegraphic network, all the public clocks of Paris with the principal clock of the Observatory.

THE British Medical Association brought its Edinburgh meeting, which has been a very successful one, to a close last Friday. Brighton has been selected as the place of meeting for next year, with Sir J. Cordy Burrows as President-elect.

It turns out that in the recent attack on the Palestine Exploring party, there were nine wounded, including Lieutenants Conder and Kitchener. Measures have been taken to secure the arrest and punishment of the assailants.

It appears from a letter in Friday's *Times* that that most interesting relic of antiquity, "Caesar's Camp" at Wimbeldon "is being deliberately levelled to the ground, effaced and destroyed by its owner, Mr. Drax, the member for Wareham." It is difficult to believe in an act of such deliberate vandalism. Mr. Drax is stated to have asked such an exorbitant price for the land that negotiations were rendered impossible; had Sir John Lubbock's "Ancient Monuments Bill" been passed this session, this evidently doomed and unreplaceable monument of antiquity could easily have been saved, and the owner would have received a fair price for his land.

M. WILFRID DE FONVIELLE made a successful night ascent on August 1, for the purpose of observing meteorites. From 10 P.M. to 4 A.M., forty-two meteorites were observed between Rheims and Fontainebleau. Some of these emanated from Cassiopeia, others from Perseus, and as many as nine took a vertical direction, descending from the part of the heavens which was concealed by the balloon. None of these were very noteworthy, and it is probable that none would have been observed at the surface of the earth. Eight persons were in the car, and another trip was to be made last Sunday from Paris.

THE International Geographical Exhibition is not the only one of the kind now open in Paris; as our readers no doubt know another has been established by M. Nicolle at the Palais des Champs Elysées for Fluvial and Maritime Industries, and is attracting an immense number of visitors. It will continue up to the month of November, when another will be opened for Electrical Industries. The English Section in the Fluvial and Maritime Exhibition is very successful. The Board of Trade has sent specimens of the apparatus in use for salvage and warnings at British seaports; the contributions by private individuals also give a fair idea of British Maritime Industries.

ON Saturday last a deputation from the Royal Colonial Institute waited upon Lord Carnarvon to urge upon Government the propriety of establishing a Colonial Museum in London. The Government, it seems, have been entertaining the idea of establishing such an institution, and Lord Carnarvon spoke hopefully of the possibility of accomplishing the praiseworthy object; he thinks it would be well to place it contiguous to the India Museum.

A CORRESPONDENT of the *Illustrated London News* of Aug. 1, writes, July 25, from Pen-y-Garden, Denbighshire, describing a shower of hay similar to that referred to in last week's *NATURE*, p. 279, as having occurred at Monkstown. It passed over the town of Wrexham, five miles distant from Pen-y-Garden, and in a direction contrary to that of the wind in the lower atmosphere.

MR. MAGNÚSSON, writing to yesterday's *Times*, reports the continued outbreak of volcanic eruptions in various parts of Iceland, and makes an earnest appeal to the British public for help to those, and they are many, who have been rendered quite destitute—landless and homeless—by the calamity. No people are

more deserving of help than the Icelanders, and moreover, they have the claim upon us of close kindred.

WE have received the "Fourth Report of the Meteorological, Magnetic, and other Observatories of the Dominion of Canada for 1874," pp. 316. The Report gives full details of the tri-daily observations made at the various meteorological stations, the monthly means and extremes, and, as regards temperature and rainfall, a comparison of the results of 1874 with the averages of previous years. The most important fact perhaps noted in the Report is the gradual extension of the system over British North America.

FROM a letter from the Canada correspondent of *The Scotsman*, dated 23rd July, 1875, we learn that the summer in Canada has been unusually cold. The nights have been quite chilly so as to necessitate extra covering; and during the whole summer the temperature has only once reached 90°; on the evening of the 18th July it fell to 43°. Capt. Richardson, of the *Nova Scotian*, which had just arrived, reports having passed a large number of icebergs on the coast, and having sailed through floating ice for twenty-four hours. Reports from the extreme north state that the ice had given way to a greater extent than for many years, in which case the Arctic Expedition will probably reach a higher latitude before the summer closes than was expected.

IN the *Bulletin Hebdomadaire* of the Scientific Association of France it is stated, after a careful review of the loss sustained by the different districts, that the total loss caused by the late inundations in the South of France exceeds the enormous sum of eighty millions of francs, and that 550 persons perished.

THE June number (just issued) of the *Bulletin* of the French Geographical Society contains an interesting chart of the world, by M. Malte-Brun, intended to exhibit at a glance the proportion of the known and unknown regions. Countries known in their details are wholly covered with red, and those of which we have a good general knowledge, with red having a slight dash of white. White, with specks of red, indicates countries imperfectly known, while those entirely unknown are left in white. Of course the various shades of red run into each other, but countries unknown and imperfectly known considerably exceed in extent the two other classes, so that there is little danger of exploring and surveying parties wanting work for many years to come. The greater part of Asia and America comes under the two last categories, as also nearly the whole of Africa and Australia; indeed, notwithstanding all that has recently been done in the way of geographical discovery, the white at least balances the red in Malte-Brun's chart.

THE same number of the *Bulletin* contains a valuable illustrated paper, by M. L. Chambeyron, giving some details concerning the physical geography of New Caledonia.

THE *Geographical Magazine* states that the committee of the statistical section of the Russian Geographical Society appointed to report on a proposition made by MM. Sobolyef and Jansson, to publish a gazetteer of Central Asia, has reported favourably on the subject. They recommend that particular attention be paid to historical geography and ethnology, as statistical data are subject to frequent alterations. The territory to be embraced by the work is bounded on the north by the watersheds of the Ural and Irtysh; on the west coast by the Caspian; on the south by the Elburz, the Hindu Kush, and the Karakorum Range; and in the east by Mongolia. The authorities for every statement made, are to be carefully referred to for future reference, and great care is to be taken with respect to the spelling. A final programme will be laid down by a joint committee of the three sections of the Russian Geographical Society.

THE *New York Tribune* of July 10 contains a long article, with many illustrations, on Prof. Hall's magnificent collection of fossils, which, at a cost of \$65,000 has been secured for the American Museum of Natural History, at the Central Park, New York.

THE Watford Natural History Society has already taken an established place in the first rank of our local societies and field-clubs. It has not been many months in existence, but already have we received the first number of its neatly printed *Transactions*, containing the following papers:—"The Cretaceous Rocks of England," by J. L. Lobley, F.G.S.; "Notes on the Flora of the Watford District," by Arthur Cottam; and "Notes on the proposed Re-issue of the Flora of Hertfordshire, with Supplementary Remarks on the Botany of the Watford District," by R. A. Pryor, F.L.S.

IN connection with the Sheffield Ladies Educational Association, Mr. Barrington Ward, F.L.S., has recently concluded a successful and well attended series of elementary lectures on Botany. The results of the examinations on the lectures appear to have been highly satisfactory, and to judge from the specimen examination paper sent us, the questions were well calculated to test the real knowledge of the students.

IN Part I. No. 1, for 1875, of the *Journal* of the Asiatic Society of Bengal will be found a very valuable illustrated paper by Major G. E. Fryer, "On the Khyeng People of the Sando-way District, Arakan." Details are given of the habits of the people, with a brief grammar and copious vocabulary of their language.

MR. G. K. GILBERT'S preliminary Geological Report contained in Lieut. Wheeler's Report of the work done by his expedition in 1872 in Nevada, Utah, and Arizona, gives a few interesting data bearing on the former glaciation of N. America. About White's Peak, in the Schell Range, Nevada, are the terminal moraines of five or six glaciers that descended to 8,000 feet altitude in lat. 39° 15'. At about the same altitude, and in lat. 39°, are moraines and an alpine lake upon the flanks of Wheeler's Peak, of the Snake Range, Nevada. Old Baldy Peak (N. lat. 38° 18'), near Beaver, Utah, overlooks two terminal moraines, one of which contains a lakelet at an altitude of about 9,000 feet. No traces were seen of a general glaciation, such as the Northern States experienced and the cumulative negative evidence is of such weight that Mr. Gilbert is of opinion that the glaciers of the region referred to were confined to the higher mountain-ridges.

THE same observer shows that the level of what is now Great Salt Lake must at one time have been much higher and its area much greater than it is at present. Former levels are marked by a series of conspicuous shore-lines carried on the adjacent mountain slopes to a height of more than 900 feet. When the waters rose to the uppermost beach they must have covered an area of about 18,000 square miles, eleven times that of the present lake, and a trifle less than that of Lake Huron; the average depth was 450 feet, and the volume of water nearly 400 times greater than now. The lake was diversified by numerous rocky islands and promontories, and its water was fresh. The flooding of the Great Salt Lake valley, Mr. Gilbert believes, marked a temporary climatal change, and was contemporary with the general glaciation of the northern portion of N. America, and with the formation of the numerous local glaciers of western mountain systems; he considers it a phenomenon of the Glacial Epoch. While the general climatal change that caused or accompanied that epoch (depression of temperature, carrying with it decrease of evaporation, if not increase of precipitation) may be adduced as the cause of the inundation of Utah, Mr. Gilbert sees no reason to suppose that the relative humidities of

the various positions of the N. American continent were greatly changed; and this consideration will aid in accounting, he thinks, for the curious fact that the ice in the eastern seaboard stretched unbroken past the fortieth parallel, while under the same latitude in the Cordilleras no glaciers formed below 9,000 feet.

THE third part of the second series of the magnificent work of Mr. William H. Edwards upon the Butterflies of North America has been published by Messrs. Hurd and Houghton, of Cambridge, Massachusetts, and embraces five plates, executed by Miss Mary Peart. The plates represent species of *Papilio*, *Argynnis*, *Apatura*, *Chionobas*, and *Lycana*; all of them being rare and, for the most part, unfigured species, and also many but recently described.

WE have received the *Journal* of the Anthropological Society for April and July, containing in full the papers which have appeared in abstract in our reports of the meetings of the Society. Many of the papers are of great value, and the illustrations, especially those of the Andamanese, are very interesting.

It is rumoured that, on the retirement of Sir Henry James from the directorship of the Ordnance Survey, a post which he has filled during a lengthened period with so much distinction, he will be succeeded by Col. A. Ross Clarke. We congratulate the Government on this selection, just at once to a most meritorious officer and to Science and the State. Col. Clarke's eminence as a mathematician and a geodesist are too highly appreciated wherever those sciences are cultivated, both at home and abroad, to need any comment from us.

THE additions to the Zoological Society's Gardens during the past week include a Manatee (*Manatus americanus*) from Demerara, a Ground Hornbill (*Bucorvus abyssinicus*), a White-thighed Colobus (*Colobus bicolor*) from West Africa, a Rose-crested Cockatoo (*Cacatua moluccensis*) from Moluccas, deposited; two Jaguars (*Felis onca*) from America, a Squirrel Monkey (*Saimaris sciurea*) from Brazil, purchased; four Amherst Pheasants (*Thaumalea amherstie*), a Siamese Pheasant (*Euplocamus corollatus*), and two Vinaceous Doves (*Turtur vinaceus*) bred in the Gardens.

PHYSICAL PROPERTIES OF MATTER IN THE LIQUID AND GASEOUS STATES*

THE investigation to which this note refers has occupied me, with little intermission, since my former communication in 1869 to the Society, "On the Continuity of the Liquid and Gaseous States of Matter." It was undertaken chiefly to ascertain the modifications which the three great laws discovered respectively by Boyle, Gay-Lussac, and Dalton undergo when matter in the gaseous state is placed under physical conditions differing greatly from any hitherto within the reach of observation. It embraces a large number of experiments of precision, performed at different temperatures and at pressures ranging from twelve to nearly three hundred atmospheres. The apparatus employed is, in all its essential parts, similar to that described in the paper referred to; and so perfectly did it act that the readings of the cathetometer, at the highest pressures and temperatures employed, were made with the same ease and accuracy as if the object of the experiment had been merely to determine the tension of aqueous vapour in a barometer-tube. In using it the chief improvement I have made is in the method of ascertaining the original volumes of the gases before compression, which can now be known with much less labour and greater accuracy than by the method I formerly described. The lower ends of the glass tubes containing the gases dip into small mercurial reservoirs formed of thin glass tubes, which rest on ledges within the apparatus. This arrangement has prevented many failures in screwing up the apparatus, and has given more precision to the

measurements. A great improvement has also been made in the method of preparing the leather-washers used in the packing for the fine screws, by means of which the pressure is obtained. It consists in saturating the leather with grease by heating it *in vacuo* under melted lard. In this way the air enclosed within the pores of the leather is removed without the use of water, and a packing is obtained so perfect that it appears, as far as my experience goes, never to fail, provided it is used in a vessel filled with water. It is remarkable, however, that the same packing, when an apparatus specially constructed for the purpose of forged iron was filled with mercury, always yielded, even at a pressure of forty atmospheres, in the course of a few days.

It is with regret that I am still obliged to give the pressures in atmospheres, as indicated by an air- or hydrogen manometer, without attempting for the present to apply the corrections required to reduce them to true pressures. The only satisfactory method of obtaining these corrections would be to compare the indications of the manometer with those of a column of mercury of the requisite length; and this method, as is known, was employed by Arago and Dulong, and afterwards in his classical researches by Regnault, for pressures reaching nearly to thirty atmospheres. For this moderate pressure a column of mercury about 23 metres, or 75 feet, in length had to be employed. For pressures corresponding to 500 atmospheres, at which I have no difficulty in working with my apparatus, a mercurial column of the enormous height of 380 metres, or 1,250 feet, would be required. Although the mechanical difficulties in the construction of a long tube for this purpose are perhaps not insuperable, it could only be mounted in front of some rare mountain escarpment, where it would be practically impossible to conduct a long series of delicate experiments. About three years ago I had the honour of submitting to the Council of the Society a proposal for constructing an apparatus which would have enabled any pressure to be measured by the successive additions of the pressure of a column of mercury of a fixed length; and working drawings of the apparatus were prepared by Mr. J. Cumine, whose services I am glad to have again this opportunity of acknowledging. An unexpected difficulty, however, arose in consequence of the packing of the screws (as I have already stated) not holding when the leather was in contact with mercury instead of water, and the apparatus was not constructed. For two years the problem appeared, if not theoretically, to be practically impossible of solution; but I am glad now to be able to announce to the Society that another method, simpler in principle and free from the objections to which I have referred, has lately suggested itself to me, by means of which it will, I fully expect, be possible to determine the rate of compressibility of hydrogen or other gas by direct reference to the weight of a liquid column, or rather of a number of liquid columns, up to pressures of 500 or even 1,000 atmospheres. For the present it must be understood that, in stating the following results, the pressures in atmospheres are deduced from the apparent compressibility, in some cases of air, in others of hydrogen gas, contained in capillary glass tubes.

In this notice I will only refer to the results of experiments upon carbonic acid gas when alone or when mixed with nitrogen. It is with carbonic acid, indeed, that I have hitherto chiefly worked, as it is singularly well adapted for experiment; and the properties it exhibits will doubtless, in their main features, be found to represent those of other gaseous bodies at corresponding temperatures below and above their critical points.

Liquefaction of Carbonic Acid Gas.—The following results have been obtained from a number of very careful experiments, and give, it is believed, the pressures, as measured by an airmanometer, at which carbonic acid liquefies for the temperatures stated:—

Temperatures in Centigrade degrees.	Pressure in atmospheres.
0	35.04
5.45	40.44
11.45	47.04
16.92	53.77
22.22	61.13
25.39	65.78
28.30	70.39

I have been gratified to find that the two results (for 13° 09 and 21° 46) recorded in my former paper are in close agreement with these later experiments. On the other hand, the pressures I have found are lower than those given by Regnault as the result of his elaborate investigation (*Mémoires de l'Académie des Sciences*, vol. xxvi. p. 618). The method employed by that distinguished physicist was not, however, fitted to give accurately

* Preliminary Notice of further Researches on the Physical Properties of Matter in the Liquid and Gaseous States under varied conditions of Pressure and Temperature." Paper read before the Royal Society by Dr. Andrews, F.R.S., Vice-President of Queen's College, Belfast.